

Appl. No. 09/672,007
Amdt. Dated June 23, 2004
Reply to Office action of March 23, 2004
Attorney Docket No. P12030-US1
EUS/JJP/04-2023

This listing of claims replaces all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A method of controlling a radio link (RL) in a mobile radio network (PLMN) for maintaining a high data transmission rate, wherein the mobile radio network (PLMN) includes at least one cell (C1) that has a number of radio channels accessible for radio connection to a corresponding number of mobile stations (MS) within the cell, said method comprising the steps of:

-channel coding (S1) a stream of user data to which redundant information is added, in accordance with a first channel coding scheme;

-transmitting (S2) said stream on a first frequency hopping radio channel (FH_RCH);

-measuring (S3) the transmission quality on the first frequency hopping radio channel (FH_RCH); and, if said transmission quality exceeds a predetermined threshold;

-switching (S6) from the first channel coding scheme to a second channel coding scheme that does not add redundant information to said stream of user data, wherein said first channel coding scheme corresponds to CS1, CS2 or CS3 according to GPRS, and wherein said second channel coding scheme corresponds to CS4 according to GPRS; and wherein said method is characterised by the further step of

-switching (S5) radio channels for sending said stream from the first frequency hopping radio channel (FH_RCH) to a second non frequency hopping radio channel (NH_RCH) in conjunction with said change of channel coding scheme.

2. (Original) A method according to Claim 1, wherein said change of coding scheme takes place in response to a comparison that shows that said measurement result fulfils a pre-set criterion that qualifies said change of channel coding scheme.

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3. (Original) A method according to Claim 1, wherein transmission on said first or said second radio channel takes place within said cell (C1) even when the mobile radio network includes several cells.

4. (Original) A method according to Claim 3, wherein prior to carrying out the steps according to Claim 1 said number of radio channels are divided into a group of frequency hopping radio channels (FH_RCH) and a group of non frequency hopping radio channels (NH_RCH).

5. (Original) A method according to Claim 4, wherein carrier waves (f_c , f_{c1} - f_{c3}) for said radio channels are divided into two groups, of which one group has solely said frequency hopping radio channels (FH_RCH) and the other group has solely said non frequency hopping radio channels (NH_RCH).

6. (Cancelled).

7. (Original) A method according to Claim 1, wherein said radio link (RL) includes an uplink and a downlink which are controlled separately in accordance with the method steps.

8. (Original) A method according to Claim 7, wherein said measurement is effected in downlink in said mobile station (MS) and the measurement result is sent in uplink on PACCH for evaluation.

9. (Original) A method according to Claim 7, wherein a switch is made from said first channel to said second channel for both uplink and downlink when said switch is made from said first coding scheme to said second coding scheme on at least either the uplink or the downlink.

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10. (Original) A method according to Claim 1 comprising the further steps of

- measuring (S7) the transmission quality on said second radio channel (NH_RCH);

- switching (S10) from said second to said first coding scheme when the transmission quality measured on the second radio channel fulfils a given criterion; and

- switching (S9) from said second radio channel to said first radio channel (FH_RCH) for transmission.

11. (Original) A radio base system (BSS) adapted to control at least one radio link (RL) in a given cell for connection to a mobile station (MS) within said cell, wherein a number of radio channels are allocated to said cell and divided into frequency hopping and non frequency hopping channels, said system comprising

- means for measuring transmission quality on said radio link (RL); and

- means for changing a coding scheme for user data sent on said radio link (RL) in accordance with the measured transmission quality, wherein said system is characterised by

- means that when changing a coding scheme from coded to uncoded transmission of user data functions to also change a radio channel for said radio link (RL) from a frequency hopping radio channel to a non frequency hopping radio channel (FH_RCH, NH_RCH).

12. (Previously Presented) A base station controller that comprises a switch connection, and a base transceiver station connection (BTS) characterised by means for carrying out the method according to Claim 1.

13. (Currently Amended) A method of controlling a radio link (RL) in a mobile radio network (PLMN) for maintaining a high data transmission rate, comprising the steps of:

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-channel coding a stream of user data to which redundant information is added in accordance with a first channel coding scheme;

-radio transmitting said stream, wherein the transmitter antenna for said radio transmission alternates between two antennas that are separated spatially or with respect to polarisation so as to obtain antenna diversity;

-measuring (S3) the transmission quality of the radio transmission; and if said transmission quality exceeds a predetermined threshold:

-switching (S6) from the first coding scheme to a second coding scheme that does not include the addition of redundant information to said stream of user data; and ~~characterised by the further step of~~

-effecting radio transmission without switching the transmission antenna.

14. (Original) A method according to Claim 13, wherein antenna switching is effected for each time slot (TS).

15. (Original) A method of controlling a radio link to enable a high user data rate to be transmitted on the link, in a mobile communication system supporting GPRS and having four alternate channel coding schemes, the first three of said four coding schemes adding redundant information when applied to a stream of user data and a fourth of said four coding schemes adding no redundant information when applied to a stream of user data, comprising the steps of:

- channel coding a first stream of user data, according to any of said first three coding schemes, to produce a first coded user data stream;

- transmitting said first coded user data stream on a first frequency hopping radio channel in a first cell;

- measuring the transmission quality on said first radio channel;

- changing the coding scheme for coding said first user data stream from any of said first three coding schemes to said fourth coding scheme, to produce an uncoded user data stream, due to the transmission quality reaching a first threshold value;

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- changing the radio channel for the transmission of said uncoded user data stream, from said first radio channel to a second, non frequency hopping, radio channel, within the first cell.

16. (Previously Presented) A method according to Claim 15 further comprising the steps of:

- measuring the transmission quality on said second radio channel;
- starting channel coding of said stream of user data, due to the transmission quality on said second radio channel reaching a second threshold value;
- changing radio channel for said transmission from said second radio channel to a third frequency hopping radio channel, in connection to said starting channel coding.

17. (Currently Amended) A radio base system arranged to control a radio link to a mobile station in a certain cell, wherein a number of radio channels are allocated to the cell and the number of radio channels are divided into a group of frequency hopping channels and a group of non frequency hopping radio channels, said radio base system comprising[[.]]:

a receiver ~~to measure~~ for measuring the transmission quality on said radio link[[.]];

a processor ~~to select~~ for selecting a coding scheme in relation to the measured transmission quality, wherein said coding scheme is selected from three channel coding schemes which add redundant information to the transmitted data or a fourth coding scheme that does not add redundant information to said transmitted data; and

a processor for channel coding a stream of user data sent on the radio link according to a selected coding scheme[[.]]; and

means to change for changing the radio channel for the radio link from a first frequency hopping radio channel to a second non frequency hopping radio channel when a change of channel coding is made from any of said first three channel coding schemes to said fourth coding scheme ~~of said coding schemes~~.

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18. (Cancelled).

19. (New) A method of controlling a radio link in a mobile radio network for maintaining a high data transmission rate, wherein the mobile radio network includes at least one cell that has a number of radio channels accessible for radio connection to a corresponding number of mobile stations within the cell, said method comprising the steps of:

channel coding a stream of user data to which redundant information is added, in accordance with a first channel coding scheme;

transmitting said stream on a first frequency hopping radio channel;

measuring the transmission quality on the first frequency hopping radio channel;

and, if said transmission quality exceeds a predetermined threshold:

switching from the first channel coding scheme to a second channel coding scheme that does not add redundant information to said stream of user data; and

switching radio channels for sending said stream from the first frequency hopping radio channel to a second non frequency hopping radio channel in conjunction with said change of channel coding scheme.

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